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Force Protection and Strategic Air Mobility:  
The MANPAD Challenge

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy

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Abstract of

Force Protection and Strategic Air Mobility:

The MANAPD Challenge

The U.S. military's reliance on strategic mobility has increased tremendously in the past decade. Strategic airlift's versatility and speed place it at the forefront of strategic mobility assets to meet the demands of Strategic Agility, Power Projection, and Dominant Maneuver. The threat from manportable or shoulder launched surface-to-air missiles (MANPADs) is beginning to degrade the U.S. military's strategic capacity and flexibility. To counter the threat Security Forces are operating under wartime constraints, which are personnel intensive. Aircraft Defense Systems (ADSs) are incomplete and vulnerable in the military strategic fleet and non-existent in the civilian air carrier fleet.

Two proposals would help meet the MANPAD challenge. Emphasis on technology improvements in Security Force detection equipment and ADSs will alleviate personnel pressures. Assigning Mobility Air Force Commanders to regional Commanders-in-Chief during contingency or wartime operations will improve the present decentralized force protection effort.

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Strategic mobility is essential for the U.S. military to be an effective fighting force today and into the 21<sup>st</sup> century. A vital part of strategic mobility is strategic air mobility. The Air Force's team members in satisfying the nation's strategic air mobility needs are the civilian air carriers. Civilian air carriers do not have the same design and features of military strategic aircraft. They are uniquely suited for transporting troops over long distances. Regional Commanders-in-Chiefs (CINCs) rely on the services of civilian air carriers to accomplish their missions. United States Transportation Command (USTRANSCOM) depends on civilian carriers to implement the strategies of Strategic Agility and Force Projection today and Dominant Maneuver in the future.

The formidable threat posed by shoulder launched or manportable surface-to-air missiles (MANPADs) has cast doubt on the continued reliability of the civilian air carriers. The U.S. military simply can not guarantee their protection. Modern MANPAD technology is starting to affect the agility of military strategic airlift as well.

This paper offers two solutions for providing unimpeded strategic air mobility support to the CINCs. First, regional CINCs must be able to receive a complete package of personnel and modern technology to counter the MANPAD threat. Additionally, an air mobility expert should be assigned to the operational commander's staff to direct theater airlift operations while ensuring force protection issues are executed. The solution for providing unfettered strategic air mobility support to the CINCs is available. Commitment is the key and the missing ingredient.

### **Airlift is Essential**

The U.S. military has become a CONUS-based, rapid-reaction force. The number of military installations closed overseas and the number of personnel shifted from overseas to CONUS in the past decade evidence this change. The change is also reflected in the National

Military Strategy's concepts of Strategic Agility and Power Projection.<sup>1</sup> The ability to react to crisis situations is emphasized as the way of the future in the Chairman of the Joint Chiefs of Staff's *Joint Vision 2010* under the concept of Dominant Maneuver.<sup>2</sup>

The U.S. military's shift to a rapid-reaction force means that the U.S. is more dependent on strategic mobility than ever. The National Military Strategy states, "Robust strategic sealift, air mobility, and ground transportation combined with prepositioned supplies and equipment ashore and afloat, are critical to maintaining strategic agility."<sup>3</sup> While all modes of strategic mobility are critical to how the U.S. military operates, the most vital mode may be strategic air mobility. Strategic air mobility's speed and versatility make it essential for expeditiously supplying a combatant CINC. *Joint Tactics, Techniques, and Procedures for Airlift Support to Joint Operations* states, "Airlift is the cornerstone of global force projection."<sup>4</sup>

#### **MANPAD Vulnerability: Airlift's "Achilles' Heel"**

Strategic airlift is also the most vulnerable mode of strategic mobility. Limitations of strategic airlift and the need for a secure environment in which airlift can operate are recognized in joint doctrine.<sup>5</sup> The most severe threat to strategic airlift in Southwest Asia and other areas around the world is the threat from MANPADs.<sup>6</sup> MANPADs have successfully downed both military and commercial aircraft. They are inexpensive, easily obtained, extremely mobile, and difficult to counter.

Providing the secure environment necessary for unimpeded airlift falls under the category of force protection. Force protection is a major concern of all military personnel, particularly with the recent terrorist attacks in Saudi Arabia and Africa. Without force protection for strategic airlift, a CINC may not receive personnel or critical supplies. Without personnel and supplies, the CINC's ability to respond to any type of crisis is severely limited.

## **The Military-Civilian Airlift Partnership**

Strategic airlift's ability to respond to the CINC's needs depends on civilian as well as military air carriers. Combatant command of the military's strategic airlift assets, which include C-5, C-17, C-141, KC-10, and KC-135 aircraft, rests with USTRANSCOM. Air Mobility Command (AMC), the Air Force component of USTRANSCOM, maintains operational control (OPCON). Civilian air carriers volunteer to augment the military's strategic airlift capability during a crisis or war via the Civil Reserve Airfleet (CRAF) program. There are three levels of CRAF commitment.<sup>7</sup> Level III is the highest and is necessary to meet the strategic airlift requirements for a two Major Theater Wars (MTW) scenario.<sup>8</sup> During a two MTW scenario the CRAF could move as much as 93 percent of the U.S. military's passengers and up to 41 percent of its required cargo.<sup>9</sup> During the DESERT SHIELD and DESERT STORM deployments, the CRAF moved 62 percent of the passengers and 27 percent of the cargo while flying 20 percent of the strategic airlift missions.<sup>10</sup>

Due to peacetime demands on USTRANSCOM's strategic airlift fleet, CRAF partners are routinely hired to augment the Department of Defense's (DoD) strategic airlift needs. Commercial air carriers augment USTRANSCOM on a routine daily basis, during contingency responses, and during crisis responses. In 1998, USTRANSCOM paid \$707 million to these carriers for airlift.<sup>11</sup> "OPCON," if the term can be applied to the civilian fleet, of commercial aircraft hired by USTRANSCOM remains with each respective carrier.<sup>12</sup> The aircraft and crew are simply chartered for a flight. However, the decision to send or not send a commercial carrier to a CINC's area of responsibility (AOR) rests with AMC.<sup>13</sup>

### MANPADs: Low-tech Lethality

The MANPAD threat is serious. Strategic airlift aircraft, both civilian and military, are vulnerable to this threat. *Joint Tactics, Techniques and Procedures for Airlift Support to Joint Operations* states, "Airlift aircraft are very vulnerable to hostile actions. Large fixed-wing airlift aircraft have significant radar signatures and lack maneuverability, and many have no onboard defensive systems. Additionally, they fly at relatively slow airspeeds, prolonging their exposure to attack."<sup>14</sup> The history of MANPAD use attests to their effectiveness. In the Gulf War, MANPADs hit almost half of U.S. aircraft lost to the Iraqi forces.<sup>15</sup>

MANPADs are small, easily operated, mobile, and deadly. An entire MANPAD system can weigh as little as 14 kg. The length is usually less than 1700 mm. It is efficient against aircraft flying at altitudes between 1300 and 5500 meters. Technical specifications for some of the world's MANPADs are in Appendix A. Engaging a target with a MANPAD is quick and easy. For example, if an aircraft is at 15,000 feet at a range of 6-8 km, a MANPAD can be set up and hit its target in less than 19 seconds.<sup>16</sup> Due to the range of these weapons, the threat from MANPADs is most critical for strategic aircraft during takeoff and landing, when the aircraft are low, slow, and unmaneuverable.

Thirty airliners or air transport aircraft have been shot down with MANPADs.<sup>17</sup> Even the most sophisticated Air Defense Systems (ADS) on board an aircraft may not be capable of stopping a MANPAD attack. An ADS confuses the seeker on a MANPAD by dispensing flares and chaff. During Operation DELIBERATE FORCE, a series of NATO-led attacks on Bosnian-Serb ground targets, a French Air Force *Mirage 2000D* was hit by a MANPAD. The *Mirage 2000D* is one of the most advanced fighter aircraft in the world.<sup>18</sup>



Though the MANPAD is lethal, it is not a perfect weapon. In downing at least 12 out of 29 aircraft with MANPADs during the Gulf War, there are no figures for how many missiles the Iraqi forces may have fired.<sup>19</sup> During the war in Afghanistan, Afghan rebels shot over 1,000 MANPADs at Soviet Air Force aircraft and downed at least 250.<sup>20</sup> Both MANPAD technology and defensive countermeasures have improved over the years. Modern MANPADs, such as the French *Matra*, Russian *Igla*, Swedish *RBS 70/90*, British *Blowpipe*, and U.S. *Stinger*, have infrared homing or laser command line-of-sight guidance seekers that are difficult to detect and counter.<sup>21</sup> Previous MANPADs relied on radar guidance. The radar signal was much broader and easier to detect. The ADS used to counter modern infrared or laser guided MANPADs relies on electronic jamming of the seeker.<sup>22</sup> While MANPADs may not have been highly effective a decade ago, modern technology has made them harder to detect and defend against.

MANPADs are available to many countries and terrorist groups around the world. They are being transported or sold to the highest bidders. There is a long list of countries and terrorist groups known to possess them (Appendixes B & C). On a recent ABC News report, the known terrorist Bin Laden admitted using his wealth and connections to purchase U.S. *Stinger* missile launchers.<sup>23</sup> During the Afghan War, the U.S. Central Intelligence Agency (CIA) gave the Afghan rebels *Stingers* to use against the Soviet Air Force. These *Stingers* were estimated to be 40 percent effective against their targets.<sup>24</sup> Bin Laden was one of the Rebels shown on the ABC World News telecast using the *Stingers*. In the late 1980s, U.S. forces captured several Iranian gunboats armed with *Stingers*. The trail of the missiles was found to track from Afghanistan, through Pakistan, and finally into Iran.<sup>25</sup> Today, of the seven states on the official U.S. list of nations supporting international terrorism, Iran is believed to be the only one still active.<sup>26</sup> In 1993, it was estimated that there were 200 to 300 unused *Stingers* in the hands of the Mojahedin

-- the former Afghan rebel organization. In an effort to curb *Stinger* proliferation, the CIA was purchasing the unused weapons for \$175,000 to \$200,000 each. The original cost of the weapon was \$35,000, and they were selling on the black market for \$100,000.<sup>27</sup> In 1990, three Provisional Irish Republican Army members were arrested while trying to purchase *Stinger* missiles and other weapons.<sup>28</sup> In the list of countries and terrorist groups that possess MANPADs, several, including Bin Laden and Saddam Hussein, have targeted and openly expressed a willingness to target U.S. interests or forces.<sup>29</sup>

To attempt to keep air lines of communication open for the CINCs and to counter the MANPAD threat, the Air Force is modifying many of its strategic airlift aircraft with ADSs. All C-17s are equipped with ADS. C-141s tasked with special operations missions have the same system. Twelve C-5s are already outfitted and the remaining are scheduled to be modified. KC-10 and KC-135 aircraft are not yet scheduled to be modified with an ADS. The system being installed in all the aircraft is a first generation ADS designed to counter an attack on a fighter aircraft. Strategic airlift aircraft have a much larger radar signature than fighters. The ADS being installed is also incapable of detecting or countering modern infrared or laser guided MANPADs.<sup>30</sup>

Commercial aircraft do not have an ADS. Due to cost (\$1 million to modify a C-5, for example<sup>31</sup>), and expenses associated with routine maintenance and inspection, the Air Force expects that commercial air carriers will not install an ADS in the near future. Another reason commercial carriers do not have ADSs is acknowledgment of the threat associated with installation. Commercial carriers are guaranteed to only fly into non-threatening areas by their contract with AMC and AMC's agreement with the Federal Aviation Administration. Installing

an ADS on a commercial carrier would tacitly acknowledge and accept the MANPAD threat. Yet, for the CRAF to be fully effective, deliveries must be made to the theater of operations.<sup>32</sup>

Today, AMC is permitting commercial air carriers, augmenting USTRANSCOM's strategic airlift mission, to fly into only a few Middle East nations because of local MANPAD threats. AMC is also dictating that military aircraft entering those same countries must be equipped with an ADS to the maximum extent possible.<sup>33</sup> "To the maximum extent possible," means that if a mission is considered to be high priority or worth the risk, and an ADS equipped aircraft is not available, one without ADS will be used.<sup>34</sup> Regardless of how aircraft are shuffled, the net result is that a reduced airlift capacity is available to support U.S. Central Command (USCENTCOM).

#### **Countering the Threat: Who's in Charge?**

The MANPAD threat is greatest overseas, particularly in Southwest Asia. Protecting strategic airlift aircraft from MANPADs in an AOR is ultimately the regional CINC's responsibility. Strategic airlift aircraft are usually transitory to a CINC's AOR; AMC retains their OPCON. The regional CINC, however, is ultimately responsible for ensuring that force protection measures are in place for all assets in his theater. His responsibility is defined in joint doctrine and it was reaffirmed or emphasized in DoD Directive 2000.12, *Combating Terrorism Program*, implemented after the attack on Khobar Towers.<sup>35</sup>

Actual force protection measures for military installations or airports used by strategic airlift assets in an AOR are commonly delegated to the service component using those facilities.<sup>36</sup> For example, strategic airlift aircraft flew missions into Kuwait City International Airport during the most recent U.S.-led Operation DESERT FOX. A Tactical Airlift Control Element (TALCE) from AMC was deployed to Kuwait City with personnel to handle supply on-

load and off-load as well as force protection for the TALCE. Force protection in a crowded, densely populated place like Kuwait City required close interaction with host nation forces. AMC was in charge of protecting their own personnel and aircraft on the ground. At the opposite end of the spectrum, Air Force presence in Saudi Arabia has been largely consolidated at Prince Sultan Air Base (PSAB), far away from populated areas. The decision to relocate the majority of air forces to PSAB was made after the attack on Khobar Towers and subsequent investigation. Personnel from across the Air Force are accomplishing the force protection mission at PSAB because it is home to a mixture of fighter and airlift aircraft. Security Forces at PSAB are providing force protection for all strategic airlift aircraft, including their departure and arrival corridors. The dilemma, however, rages on. Who is in charge? Regardless of where Security Forces or Military Police are sourced, if they are conducting operations in a CINC's AOR, that CINC is ultimately responsible for ensuring force protection.

AMC's Commander makes the ultimate decision for sending civilian air carriers into an AOR and setting policy for strategic airlift aircraft. The decision is based on a risk assessment performed by AMC's Threat Working Group (TWG). The TWG also recommends policy, such as whether to send ADS equipped aircraft into certain countries. The Director of Intelligence at AMC heads the TWG, which works closely with USTRANSCOM's Joint Intelligence Center to gather information.<sup>37</sup>

For the MANPAD threat, the TWG has developed a MANPAD Vulnerability Risk Assessment matrix that includes criteria such as Terrorist Threat, Threat to Military Operations, Security of MANPAD Footprint, MANPAD Availability, Intent to Carry Out Standoff MANPAD Attack, Government Stability/Regional Political Tensions, and Mitigating Factors.<sup>38</sup>

Using those criteria and information from intelligence reports, the recommendation on use of civilian air carriers is made.

There are options for countering the MANPAD threat if civilian air carriers must be used. One option is to have aircraft arrive and depart at night, when aircraft markings are difficult to see. Attackers would not know if they were firing at U.S. aircraft, one from their own country, or a neighboring country. Another option is to have aircraft fit into routine or peak-period commercial arrivals and departures for a large airport like Kuwait City. A third option is to work with host nations to have aircraft follow non-regular or varying altitudes as well as arrival patterns or routes. The dilemma in applying any of those options is analogous to the argument for not installing the ADS. Civilian aircraft will not be sent into an AOR where the threat is assessed as high. Using unique techniques would be a tacit acknowledgment and acceptance of the high risk.

### **The Spectrum of War and Airlift Security**

If the U.S. is involved in a MTW, the security of the area where strategic airlift would operate is to be accomplished in accordance with *Joint Tactics, Techniques, and Procedures for Base Defense*. The CINC or Joint Forces Commander (JFC) would appoint a Joint Rear Area Coordinator (JRAC). The JRAC would establish a secure area to conduct all supporting operations for the war. Aircraft arrival routes and procedures would be coordinated with the airspace control authority and published in the airspace control plan per direction of the Joint Forces Air Component Commander (JFACC).<sup>39</sup>

The JRAC's tasks are further defined in *Corps Operations*.<sup>40</sup> For a MTW, the "footprint" established by arriving U.S. forces and the security requirements have been defined. While the threat may be obvious to forces in a MTW, available defensive measures and their employment

are unambiguous as well. Once the rear area of operations is secure, use of civilian air carriers should not pose a high risk.

The MANPAD risk to strategic airlift, and civilian air carriers in particular, is highest when the air bridge is being established. The "air bridge" is a term used to define USTRANSCOM's plan to establish the air lines of communication and an uninterrupted flow of strategic airlift. Strategic airlift is crucial because it is also the means of deploying the JRAC and the associated forces. Strategic airlift may be delivering heavy equipment and personnel or it may be bringing soldiers to meet up with pre-positioned or afloat heavy armor. That armor and associated equipment is useless unless personnel arrive to operate it. While the air bridge is being set up, the joint rear area has not been established or secured.

For military operations other than war (MOOTW), there may not even be a rear area. The area where operations are being conducted may be the area where strategic airlift operates. For example, during Operations RESTORE HOPE in Somalia and RESTORE DEMOCRACY in Haiti, the main airfield in each country was where the operation was taking place. In both instances, civilian air carriers were not used because the risk was determined to be too high. Force protection was provided by U.S. Army helicopter patrols before strategic aircraft arrived, while they were on the ground, and for their departure.

One of the major conclusions of a Defense Science Board Study was that U.S. forces are more vulnerable to terrorist threats today than at any time in the past.<sup>41</sup> U.S. military strategic airlift aircraft equipped with ADS are shouldering the load for supporting USCENTCOM's AOR because of assessments like the Defense Science Board's. Security Forces in the region are using some of the same tactics, techniques, and procedures that would be employed during a MTW. For example, before any strategic airlift aircraft arrives at PSAB, motorized patrols make

their presence known as far out as 30-40 km from the base. The base perimeter at PSAB is 10 km. The same technique is used at Kuwait City, except host nation forces conduct the patrols.<sup>42</sup>

The problem with employing wartime techniques in peacetime is that current force structure is not large enough to support them. Because we have a much smaller force, the Security Forces rely on sensor technology to keep vigilance. Sensors have their limitations, though. While they may be able to detect personnel or even a MANPAD launch, they can do little in the way of preventing a launch that can reach its target in 19 seconds or less.

While a MANPAD has not downed a U.S. aircraft since the Gulf War, the threat of MANPADs has limited the U.S. in executing its strategies of Power Projection and Strategic Agility. During Operation DESERT FOX, forces were needed in USCENTCOM's AOR to defend against a possible Iraqi retaliation to the air strikes. Those forces were transported via USTRANSCOM chartered commercial air carriers as far away as Europe. From Europe, the forces were transferred to military strategic airlift aircraft equipped with ADS for the flight into the AOR.<sup>43</sup> If the CINC or JFC needed supplies along with those personnel, he would have needed to prioritize the flow because of the competing need for military strategic airlift aircraft. One of the lessons learned by the U.S. Army from Operation RESTORE HOPE centered on the role of strategic airlift. There would have been an estimated 41 percent increase in throughputs and delivery rates had chartered civilian aircraft been used, and if the C-17 had been available instead of the C-5.<sup>44</sup> The C-5 took up too much ramp space at the airfield. Only one aircraft could be on the airfield at a time. Production of C-17s could not be accelerated. The use of commercial airlift, however, could have occurred if the airfield and the surrounding area were deemed secure. Security of the airfield in Mogadishu, Somalia was a joint operation under JFC

control, but rules of engagement and constraints put on forces in the area did not allow them to establish a secure area large enough to permit safe use of civilian aircraft.

Any operational plan or concept of operations coordinated with USTRANSCOM for transportation of troops will inevitably include reliance on civilian air carriers. Civilian airliners are made for carrying passengers. Military strategic aircraft are designed to transport oversized and outsized military equipment. By taking civilian air carriers out of the force deployment equation, pre-planned time-phased force deployment data for many operations or concepts may have to be re-evaluated or recalculated. It may take much longer to get troops and equipment to a theater because of the MANPAD threat. Strategic air mobility's speed and versatility advantages are waning. The CINC's ability to accomplish his mission will be adversely affected.

#### **Addressing the Challenge: Resources and Restructure**

To ensure that the full spectrum of strategic air mobility will be available for regional CINCs and to carry out our strategy of Dominant Maneuver in the future, three actions must be accomplished immediately. First, state-of-the-art ADS technology needs to be installed in all military strategic airlift aircraft. Second, the CINC needs to allocate more Security Forces or Military Police to focus on MANPAD detection and defense. Third, the CINC needs to assign responsibility for the protection of strategic airlift aircraft in his AOR to an expert on airlift operations. Two findings in the Report of the Downing Assessment Task Force after the attack on Khobar Towers concurred with all those assessments.<sup>45</sup> Compliance with the report, however, has not gone far enough.

The need for a state-of-the-art ADS is obvious. MANPAD technology has leapfrogged the countermeasures that are being installed today. MANPAD accessibility is high. The U.S.



military's strategic airlift fleet must be available to support the combatant CINCs even if civilian air carriers are not.

In an attempt to provide more forces and modern technology, the Chairman of the Joint Chiefs of Staff has set up a counter-terrorism task force under the J-3 Directorate. The task force visits overseas military installations and helps the commander establish the proper force protection posture.<sup>46</sup> Since the Air Force will most likely be responsible for force protection of its assets, it has established the 820<sup>th</sup> Force Protection Battlelab. The Battlelab is the Air Force's front line Security Force. It is designed to establish a secure environment at deployed locations so that forces can enter.<sup>47</sup> While both of these actions are laudable, they did not generate more forces or accelerate technology development. They did provide unity of effort from both a single service and joint perspective. By consolidating force protection expertise at the Joint Staff, positions were created that took personnel away from positions at Headquarters, Corps, and Wing levels. Also, another level of bureaucracy was added to help the CINC perform his job. The same argument can be made for the Air Force's Battlelab. The plan for the Battlelab is to consolidate over 500 Security Force personnel in the same location. Security Forces are planned to come from outsourced and privatized security positions at various CONUS Air Force Wings.<sup>48</sup> Considering the foundation of force protection for all deployed forces in USCENTCOM's AOR is a secure footprint, more personnel are needed in outlying areas of military installations overseas.

Technological superiority for Security Forces or Military Police would help alleviate personnel shortfalls, but is limited in what it can accomplish. Development and employment of advanced sensors can not be underemphasized. Another proposal is use of camera-mounted

unmanned aerospace vehicles (UAVs).<sup>49</sup> While UAVs can provide surveillance, they can do little in the way of stopping MANPAD launches.

To meet the real intent of the Downing Assessment and Force Protection Battlelab's goals, all U.S. military forces need the ability to react to threats outside their base perimeter. All Security Forces or Military Police securing areas where strategic aircraft will traverse need to have forces available to provide a presence like the one at PSAB. Short of that, they need helicopter patrols capable of detecting, defending against, and destroying the MANPAD threat. Emphasis has been placed on force protection because of terrorist attacks on Khobar Towers and the U.S. Embassies in Kenya and Tanzania, but procedures necessary to allow chartered commercial aircraft to deliver personnel to an AOR have not been developed.

To emphasize the importance of force protection, the DoD uses maxims in the Downing Assessment and the Defense Science Board Study that say everyone is responsible for force protection. While everyone needs to practice diligence for force protection, the truth of the matter is that the force protection requirements are different for individuals, fighter aircraft bases, helicopters, ground personnel, and strategic airlift aircraft.

USTRANSCOM has addressed force protection and other airlift-specific problems by providing a Director of Mobility Forces (DIRMOBFOR) to the CINC or JFC during contingencies or major deployments. The DIRMOBFOR's job is to be a liaison with USTRANSCOM on airlift matters that concern the CINC.<sup>50</sup> He has no authority over forces in the region, but he is usually a general officer and an airlift expert. AMC's Security Forces Directorate offers an advisor to accompany the DIRMOBFOR on deployments to ensure force protection measures are handled properly.<sup>51</sup> Not giving the DIRMOBFOR authority over air

mobility forces in a region, however, is like giving a general officer command with no authority over his troops.

The DIRMOBFOR should be assigned to the CINC, work beside the JFACC, be designated the Mobility Air Forces Commander (MAFC), and be given OPCON of air mobility forces in the CINC's AOR. The concept is not new. It is spelled out in *Joint Tactics, Techniques and Procedures for Airlift Support to Joint Operations*, except AMC currently retains OPCON of the forces.<sup>52</sup> Under this proposal the MAFC would have OPCON over the airlift coordination cell in the air operations center, deployed TALCEs, theater airlift control systems, and tactical airlift aircraft. By aligning all deployed AMC forces under a MAFC, lines of command and control would be greatly simplified and a greater unity of effort achieved. It would also be extremely beneficial during MOOTW such as Somalia, where a JFACC was not designated. A MAFC would provide airlift expertise to command and execute all air mobility functions, including force protection. A compelling reason for expanding the current liaison role of the DIRMOBFOR to one of command, and assigning AMC deployed forces to the regional CINC, is to be in compliance with DoD Directive 2000.12. Since a regional CINC is responsible for force protection of all deployed forces he should have OPCON of those forces. Former Secretary of Defense William Perry told the Senate Armed Services Committee, after the terrorist attack on Khobar Towers, that the military was not meeting the intent of the Goldwater-Nichols Act by having a commander 7,000 miles away.<sup>53</sup> Having a DIRMOBFOR in an AOR, but not having him in an authoritative position to deal with issues like force protection, is exactly what the former Secretary of Defense said not to do.

To concentrate, employ, and sustain our forces when and where we choose, at a speed our adversaries can not match, is the objective. Rapidly deploying forces and being able to respond

to any crisis anywhere in the world is a decisive point in attaining that objective. The MANPAD threat is denying access. The civilian air carriers are vital team members for our strategic mobility needs, yet their availability is not assured. The threat is beginning to affect military strategic airlift assets as well. Clausewitz proposed that changes in military hardware or their capability are not major concerns. If an enemy has an advantage in weapons it is only a matter of time before the other side acquires the same weapon or a means to counter the advantage. Eventually both sides will become equal and the superior side will prevail.<sup>54</sup> In the case of MANPADs, our counter to the threat is a show of force. We do not yet have the technology to guarantee the safety of every strategic aircraft. While we are trying to make that technology a reality, we are countering the threat by making our presence known. At PSAB, the show of force is extensive ground security enforcement that allows civilian air carriers to fly in and out. But using a show of force to deter the use of MANPADs will only be successful if the forces are directed to the right location at the right time. USTRANSCOM's DIRMOBFORs have the expertise to ensure all available resources are used so the U.S. military can achieve its strategic mobility objective. The capability to safely deter the MANPAD threat and provide a clear chain of command for all airlift issues, including force protection, is available. We need the commitment to make it work.

# Appendix A - MANPAD Technical Specifications<sup>55</sup>

US Designation	SA-7	SA-14	SA-18	SA-16
Launcher length	1500mm	1500mm	1700mm	1700mm
System Weight	16kg	16kg	18kg	18kg
Max Altitude (m)	3500	4500	4500	5200
Avg Speed (m/s)	500	470	570	570
Guidance System	P-Infrared	P-Infrared		P-Infrared
Max Effective Alt	2300m	1500m		3500m

US Designation	Stinger	Blowpipe	Matra	Strela
Launcher length	1500mm	1400mm	1860mm	1500mm
System Weight	16kg	14.5kg	24kg	16kg
Max Altitude (m)	8000	3500	5500	4200
Avg Speed (m/s)				500
Guidance System	P-Infrared	LOS	P-Infrared	P-Infrared
Max Effective Alt	3500m	2500m	3000m	2300m

US Designation	Vanguard	Hongying	Sakr Eye	Anza MkII
Launcher length	1530mm	1450mm	1400mm	1500mm
System Weight	16.5kg	16kg	15kg	16.5kg
Max Altitude (m)	5000	2500	4400	5000
Avg Speed (m/s)				600
Guidance System	P-Infrared			P-Infrared
Max Effective Alt	4000m		2400m	4000m

P = Passive

LOS =  
Line of Sight

## Appendix B - Countries Known to Possess MANPADs<sup>56</sup>

Abu Dhabi	Japan	Tunisia
Afghanistan	Jordan	Turkey
Angola	Kuwait	Uganda
Argentina	Laos	United Arab Emirates
Australia	Lebanon	United Kingdom
Austria	Libya	Venezuela
Bahrain	Malawi	Yemen
Belgium	Malaysia	Yugoslavia
Benin	Mali	Zambia
Bosnia	Mauritius	Zimbabwe
Botswana	Mexico	
Brazil	Mongolia	
Bulgaria	Morocco	
Cambodia	Mozambique	
Canada	Netherlands	
Cape Verde Islands	Nicaragua	
Chile	Nigeria	
Chad	North Korea	
China	Norway	
Croatia	Oman	
Cuba	Pakistan	
Cyprus	Peru	
Czech Republic	Philippines	
Denmark	Poland	
Dubia	Portugal	
Ecuador	Qatar	
Egypt	Romania	
Ethiopia	Saudi Arabia	
France	Seychelles	
Finland	Sierra Leone	
Germany	Singapore	
Ghana	Slovakia	
Greece	Slovenia	
Guinea	Somalia	
Guyana	South Africa	
Hungary	South Korea	
India	Spain	
Indonesia	Sudan	
Iran	Sweden	
Iraq	Switzerland	
Ireland	Syria	
Israel	Tanzania	
Italy	Thailand	

Appendix C - Groups Known or Suspected of Possessing MANPADs<sup>57</sup>

<u>Group</u>	<u>Country</u>
Hezbollah	Lebanon
Irish Republican Army	Northern Ireland
Kurdish Workers Party	Turkey
UNITA	Angola
Mojahedin	Afghanistan
Contras, Sandinistas	Nicaragua
Various warring factions	Bosnia-Herzegovina
Farabundo Marti National Liberation Front	El Salvador
Chechen rebels	Chechnia
Tamil Tigers	Sri Lanka
Various warring factions	Somalia
GIA	Algeria
Muslim AMAL	Lebanon
Rwanda Patriotic Front	Rwanda
Sudanese People's Liberation Army	Sudan
Iranian Revolutionary Guards	Iran

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Notes

- <sup>1</sup> Joint Chiefs of Staff, National Military Strategy (Washington: 1997), 3.
- <sup>2</sup> Joint Chiefs of Staff, Joint Vision 2010 (Washington: 1997), 20.
- <sup>3</sup> National Military Strategy, 29.
- <sup>4</sup> Joint Chiefs of Staff, Joint Tactics, Techniques and Procedures for Airlift Support to Joint Operations (Joint Pub 4-01.1) (Washington, D.C.: July 20, 1996), v.
- <sup>5</sup> Ibid, III-5.
- <sup>6</sup> Roger Maher, Colonel, USAF, Director of Intelligence Headquarters Air Mobility Command, telephone conversation with author, 25 January 1999.
- <sup>7</sup> Joint Pub 4-01.1, II-9.
- <sup>8</sup> Headquarters Air Mobility Command. Civil Reserve Air Fleet Critical to Readiness. (Scott Air Force Base, IL. 1989), 34.
- <sup>9</sup> Ibid, 23-24.
- <sup>10</sup> Lamontagne, John Captain <[John.Lamontagne@scott.af.mil](mailto:John.Lamontagne@scott.af.mil)> "CRAF Questions." 4 January 1999. Office communication. (4 January 1999).
- <sup>11</sup> Civil Reserve Air Fleet Critical to Readiness, 37.
- <sup>12</sup> Joint Pub 4-01.1, II-7.
- <sup>13</sup> Ibid, II-2.
- <sup>14</sup> Ibid, III-5.
- <sup>15</sup> S. Zaloga, "Russian Manportable Surface-to-Air Missiles," Jane's Intelligence Review, April 1994, 147.
- <sup>16</sup> Mark Hewish and Joris Janssen Lok, "Moderating MANPADS' Mean Streak," Jane's International Defense Review, March 1998, 53.
- <sup>17</sup> Zaloga, 147.
- <sup>18</sup> Hewish, 52.



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<sup>19</sup> Zolaga, 153.

<sup>20</sup> Thomas Hunter, "Manportable SAMs: The Airline Anathema," Jane's Intelligence Review, October 1996, 474.

<sup>21</sup> Hewish, 50.

<sup>22</sup> Ibid, 52.

<sup>23</sup> David Phinney, "Mixing Business with Terror, Bin Laden Uses Fortune and Businesses to Build Alliances," ABC World News, 10 January 1999, <<http://abcnews.com>>, (10 January 1999).

<sup>24</sup> Hunter, 474.

<sup>25</sup> Ibid.

<sup>26</sup> Stefan Leader, "Cash for Carnage: Funding the Modern Terrorist," Jane's Intelligence Review, May 1998, 42.

<sup>27</sup> Hunter, 474.

<sup>28</sup> Leader, 42.

<sup>29</sup> "Reward for Shootdown: Iraq Attacks U.N. Plan." <[abcnews.com](http://abcnews.com)> Reuters. (1 February 1999).

<sup>30</sup> Hewish, 51.

<sup>31</sup> Mike Paul, Major, USAF, Chief Air Defense Systems, Headquarters Air Mobility Command, Telephone conversation with author, 25 January 1999.

<sup>32</sup> U.S. Air Force, Organization and Employment of Aerospace Power, (Air Force Doctrine Document 2), (Maxwell Air Force Base AL: 28 September 1998) 29.

<sup>33</sup> Maher.

<sup>34</sup> Ibid.

<sup>35</sup> Joint Chiefs of Staff, Joint Tactics, Techniques, and Procedures for Base Defense (Joint Pub 3-10.1) (Washington D.C.: 23 July 1996), II-1.  
Department of Defense, DoD Combating Terrorism Program, (DoD Directive 2000-12) (Washington D.C.: 15 September 1996), 8.

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- <sup>36</sup> Joint Pub 3-10.1, II-2.
- <sup>37</sup> Headquarters Air Mobility Command, Threat Working Group, (AMCI 14-106), (Scott Air Force Base, IL: 24 September 1997), 1.1.
- <sup>38</sup> Moffett, Christopher Captain, <[Christopher.Moffett@scott.af.mil](mailto:Christopher.Moffett@scott.af.mil)>, "Threat Working Group," 4 January 1999. Office communication. (4 January 1999).
- <sup>39</sup> Joint Pub 3-10.1.
- <sup>40</sup> Department of the Army, Corps Operations (FM-100-15) (Washington D.C.: 29 October 1996), C-1-C-8.
- <sup>41</sup> Department of Defense, The Defense Science Board 1997 Summer Study Task Force on DoD Response to Transnational Threats; Volume 1 – Final Report (Washington: 1997), 14.
- <sup>42</sup> Paul Duke, Lieutenant Colonel, USAF, Operations Officer, USCENTCOM Force Protection Directorate, telephone conversation with author, 15 December 1998.
- <sup>43</sup> Lomantagne.
- <sup>44</sup> Department of the Army, Operation Restore Hope Lessons Learned Report, (Fort Leavenworth, KS: December 1994), 9.
- <sup>45</sup> Department of Defense, Force Protection Assessment of USCENTCOM AOR and Khobar Towers, (Washington: 1996), vii.
- <sup>46</sup> Jack Weible, "Facing 'A Different Threat,' Office to Combat Terrorism Born Out of Khobar Bombing," Army Times, (12 May 1997), 28.
- <sup>47</sup> "Special Units Assess and Combat Threats," Air Force Times, (26 January 1998), 15.
- <sup>48</sup> Michael E. Dickey, Lieutenant Colonel, USA, Operations Officer 820<sup>th</sup> Force Protection Battlelab, telephone conversation with author, 25 January 1999.
- <sup>49</sup> James N. Hanley, "Force Protection of Strategic Airlift Forces in the Operations Other Than War Environment," Defense Technical Information Center, September 1996.
- <sup>50</sup> Joint Pub 4-01.1, II-10.
- <sup>51</sup> Robert Eatman, Captain, USAF, Chief Contingency Operations Branch, Security Forces Directorate, Headquarters Air Mobility Command, telephone conversation with author, 15 December 1998.
- <sup>52</sup> Joint Pub 4-01.1, II-9.

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<sup>53</sup> William J. Perry, "Opening Statement by the Secretary of Defense before the Senate Armed Services Committee on the Downing Assessment Task Force," 18 September 1996, 7.

<sup>54</sup> Carl von Clausewitz, On War (Princeton: University Press 1989), 76-77.

<sup>55</sup> Tony Cullen and Christopher F. Foss, ed., Jane's Land Based Air Defence (Great Britain: Biddles Ltd., 1998-99), 3-39.

<sup>56</sup> Hunter, 476.

<sup>57</sup> Ibid, 475.

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